Name: Date:

Polynomial Factoring solution (version 35)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 7 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(7)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 28}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-12}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 3}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{3}\, i}{2}$$

$$x = -2 \pm \sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 - 2i$ and $-3 - 8i$ in standard form $(a + bi)$.**

Solution

$$(-9 - 2i) \cdot (-3 - 8i)$$

$$27 + 72i + 6i + 16i^2$$

$$27 + 72i + 6i - 16$$

$$27 - 16 + 72i + 6i$$

$$11 + 78i$$

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3. **Write function $f(x) = x^3 + 7x^2 + 14x + 8$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	7	14	8
-4		-4	-12	-8
	1	3	2	0

$$f(x) = (x + 4)(x^2 + 3x + 2)$$

$$f(x) = (x + 4)(x + 2)(x + 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 8) \cdot (x + 3)^2 \cdot (x - 2)$$

Sketch a graph of polynomial $y = p(x)$.